## REMARKS

### Summary

Claims 1-24 were pending, and all of the Claims were rejected in the Office action. Claims 1, 13, and 23 have been amended by this paper. Claim 24 is new. All amendments are made relative to the patent specification, including the claims.

The support of the amendment and new claims may be found in col. 6, lines 40-51 and col. 7, lines 16-39. The Applicants respectfully traverse the rejection of the claims, as set forth below. According to MPEP Section 1453, only the amended claims are presented in the previous section. However, a complete list of claims is also attached at the end of this paper for the Examiner's convenience.

### Reissue Applications

Claims 1-23 are rejected under 35 U.S.C. 251 as being based on matter added to the patent not supported by the prior patent. Claims 1, 13, and 23 have been amended. The limitation "the plurality of metal plates are disposed so as to be electrically parallel with the bellows" is replaced by "the plurality of metal plates are configured to pass high frequency current so that the plasma treatment equipment have a small susceptance impedance with low frequency dependency and high power consumption efficiency." The support of the amendment may be found in col. 7, lines 16-39. Applicant respectfully requests the Examiner to withdraw the rejections.

### Claim Rejections under 35 U.S.C. § 112

Claims 1-23 are rejected under 35 U.S.C. 112 as failing to comply with the written description requirement. Claims 1, 13, and 23 have been amended. The limitation "the plurality of metal plates are disposed so as to be electrically parallel with the bellows" is replaced by "the plurality of metal plates are configured to pass high frequency current so that the plasma treatment equipment have a small susceptance impedance with low frequency dependency and high power consumption efficiency." The support of the amendment may be found in col. 7, lines 16-39. Applicant respectfully requests the Examiner to withdraw the rejections.

**Claim Rejections under 35 U.S.C. § 103**

Claims 1-23 were rejected under 35 U.S.C. § 103(a) as being obvious over the Admitted Prior Art (APA) in view of Kawakami et al. (JP 06-333879; "Kawakami"), Sakai et al. (JP 10-032171;"Sakai"), or Kagatsume et al. (US 4,908,095; "Kagatsume").

Claim 1 recites plasma treatment equipment configured such that "the chamber wall of the chamber and the susceptor electrode are AC shorted to each other by **a plurality of metal plates... the plurality of metal plates are configured to pass high frequency current** so that the plasma treatment equipment have a small susceptance impedance with low frequency dependency and high power consumption efficiency." The cited reference does not teach or suggest at least these limitations.

The Examiner admits that APA does not disclose **a plurality of metal plates** and alleges that each of the other cited references teach these limitations by disclosing a metal element. The disclosure of "a metal element" in these references, however, is not a disclosure of a metal plate **configured to pass high frequency current**. First, Kawakami discloses elastic bellows 14 connecting a lower electrode 8 and a lower electrode supporter 12 (Kawakami, FIGS. 1 and 6). The bellows 14, however, are not a metal plate. Second, Sakai discloses a coil 12 connecting a lower electrode 8 and a reaction chamber 6. The coil 12, however, is not a metal plate. Third, Kagatsume discloses a side wall of the chamber and the susceptor electrode are AC shorted to each other by a bellows 27 (Kagatsume, FIG. 5 and lines 52-57, section 5). However, the metal element 27 is not a metal plate. Therefore, the cited references do not teach that "the chamber wall of the chamber and the susceptor electrode are AC shorted to each other by **a plurality of metal plates ... configured to pass high frequency current.**"

The Examiner further alleges it would be obvious to use a metal plate from the disclosed bellows and coils because the only difference between them is the "particular shape of the metal elements." Applicant respectfully disagrees. In fact, the metal elements disclosed in the cited references would result in a structure with the opposite effect of Applicant's claimed structure. The impedance of a metal element depends on frequency of the power source and the shape of the metal element. In the cited

references, the impedances of the bellows and coils increase as the frequency increase. The increased impedance would consume much more power and decrease the overall power consumption efficiency. Thus, the cited references do not teach that "the plurality of metal plates are configured to pass high frequency current so that the plasma treatment equipment have a **small susceptance impedance** with **low frequency dependency** and high power consumption efficiency."

Therefore, Claim 1 is allowable for at least this reason. Accordingly, claims 13 and 23 are allowable for similar reasons. Claims 2-10, 14, 17-22, and 24 are allowable either as claims dependent on an allowable base claim.

Further, new claims 24 recites that "the plurality of metal plates are mesh forms disposed in point symmetry with respect to the center of the shield." The cited references do not teach or suggest at least these limitations. Claim 24 is allowable for at least this reason.

**Listing of Claims**

What is claimed is:

1. (Four Times Amended) A plasma treatment equipment having a chamber for performing plasma treatment, the plasma treatment equipment comprising:

a plasma excitation electrode to which a power for plasma excitation is supplied, the plasma excitation electrode being provided in the chamber; and

a susceptor electrode that is opposed to the plasma excitation electrode provided in the chamber, the susceptor electrode having the same DC potential as that of a chamber wall of the chamber, the susceptor electrode being an electrode into which a high frequency electric current based on the power for plasma excitation flows after passing through a plasma space;

wherein the chamber wall of the chamber and the susceptor electrode are AC shorted to each other by a plurality of metal plates, the susceptor electrode is connected to the chamber wall of the chamber by a bellows disposed outside the chamber, the plurality of metal plates are configured to pass high frequency current so that the plasma treatment equipment have a small susceptance impedance with low frequency dependency and high power consumption efficiency [Plasma treatment equipment in which a chamber wall and a susceptor electrode having the same DC potential are AC shorted to each other].

2. (Original) The plasma treatment equipment according to claim 1, wherein said chamber wall and said susceptor electrode are shorted to each other at a location that is within a distance shorter than 500 mm from a side wall of the chamber wall.

3. (Original) The plasma treatment equipment according to claim 1, wherein said susceptor electrode is shorted to said chamber wall at a short point on a bottom wall of the chamber wall, said short point being located within a distance shorter than 500 mm from a side wall of the chamber wall as measured along the bottom wall.

4. (Amended) The plasma treatment equipment according to claim 3, wherein [said susceptor electrode is shorted to said chamber wall by a metal plate, said] each metal plate [being] is connected between the short point on the bottom wall and a second short point on a shield of the susceptor electrode.

5. (Amended) The plasma treatment equipment according to claim [3]4, wherein the said metal plate is inclined with respect to the bottom wall, and an angle formed between said metal plate and the bottom wall is less than 45 degrees.

6. (Original) The plasma treatment equipment according to claim 1, wherein said chamber wall and said susceptor electrode are shorted at a plurality of short points.

7. (Original) The plasma treatment equipment according to claim 6, wherein the plurality of short points are disposed approximately symmetrically with respect to a center of said susceptor electrode.

8. (Original) The plasma treatment equipment according to claim 6, wherein the plurality of short points are disposed approximately symmetrically with respect to a center of a shield of said susceptor electrode.

9. (Original) The plasma treatment equipment according to claim 1, wherein said susceptor electrode comprises a shield having the same DC potential as said chamber wall, and said shield and said chamber wall are AC shorted to each other.

10. (Original) The plasma treatment equipment according to claim 1, wherein said susceptor electrode is shorted to a side wall of the chamber wall.

11. (Original) Plasma treatment equipment comprising:

a plasma chamber having a bottom wall and a side wall; and

a susceptor electrode disposed within the plasma chamber, said susceptor electrode comprising a generally planar shaped electrode portion oriented substantially

parallel to the bottom wall of the plasma chamber, said susceptor electrode further comprising a generally planar shaped shield disposed adjacent to said electrode portion, said shield being located between said electrode portion and the bottom wall of the plasma chamber,

wherein the bottom wall of the plasma chamber and the shield of the susceptor electrode have the same DC potential,

wherein the bottom wall of the plasma chamber and the shield of the susceptor electrode are AC shorted to each other by a metal plate, said metal plate having a first end connected to a first short point on the shield and a second end connected to a second short point on the bottom wall of the chamber, and

wherein the second short point is located within 500 mm of the side wall of the plasma chamber.

12. (Original) Plasma treatment equipment comprising:

a plasma chamber having a bottom wall and a side wall; and

a susceptor electrode disposed within the plasma chamber, said susceptor electrode comprising a generally planar shaped electrode portion oriented substantially parallel to the bottom wall of the plasma chamber, said susceptor electrode further comprising a generally planar shaped shield disposed adjacent to said electrode portion, said shield being located between said electrode portion and the bottom wall of the plasma chamber,

wherein the side wall of the plasma chamber and the shield of the susceptor electrode have the same DC potential, and

wherein the side wall of the plasma chamber and the shield of the susceptor electrode are AC shorted to each other by a metal plate, said metal plate having a first end connected to a first short point on the shield and a second end connected to a second short point on the side wall of the chamber.

13. (New) <u>A plasma treatment equipment having a chamber for performing plasma treatment, the plasma treatment equipment comprising:</u>

a plasma excitation electrode to which a power for plasma excitation is supplied, the plasma excitation electrode being provided in the chamber;

a susceptor electrode that is opposed to the plasma excitation electrode provided in the chamber; and

an electrode shield of the susceptor electrode in the chamber,

wherein at least one of the susceptor electrode and the electrode shield thereof has the same DC potential as that of a chamber wall of the chamber,

the susceptor electrode being an electrode into which a high frequency electric current based on the power for plasma excitation flows after passing through a plasma space,

the chamber wall of the chamber and at least one of the susceptor electrode and the electrode shield thereof are AC shorted to each other by a plurality of metal plates, and

the susceptor electrode is connected to the chamber wall of the chamber by a bellows disposed outside the chamber, the plurality of metal plates are configured to pass high frequency current so that the plasma treatment equipment have a small susceptance impedance with low frequency dependency and high power consumption efficiency.

14. (New) The plasma treatment equipment according to claim 13, wherein the electrode shield of the susceptor electrode has the same DC potential as that of the chamber wall of the chamber, and the chamber wall of the chamber and the electrode shield of the susceptor electrode are AC shorted to each other.

15. (New) The plasma treatment equipment according to claim 14, wherein said chamber wall and said electrode shield are shorted to each other at a location that is within a distance shorter than 500 mm from a side wall of the chamber wall.

16. (New) The plasma treatment equipment according to claim 15, wherein said electrode shield is shorted to said chamber wall at a short point on a bottom wall of

the chamber wall, said short point being located within a distance shorter than 500 mm from a side wall as measured along the bottom wall.

17. (New) The plasma treatment equipment according to claim 14, wherein said chamber wall and said electrode shield are shorted at a plurality of short points.

18. (New) The plasma treatment equipment according to claim 17, wherein the plurality of short points are disposed approximately symmetrically with respect to a center of said electrode shield.

19. (New) The plasma treatment equipment according to claim 14, wherein said electrode shield is shorted to a side wall of the chamber wall.

20. (New) The plasma treatment equipment according to claim 16, wherein said electrode shield is shorted to said chamber wall by a metal plate, said metal plate being connected between the short point on the bottom wall and a second short point on the electrode shield.

21. (New) The plasma treatment equipment according to claim 20, wherein said metal plate is inclined with respect to the bottom wall, and an angle formed between said metal plate and the bottom wall is less than 45 degrees.

22. (New) The plasma treatment equipment according to claim 13, wherein the at least one of the electrode and the electrode shield being at the same DC potential as the chamber wall is the electrode, the electrode being shorted to the chamber wall by a metal plate.

23. (New) A plasma treatment equipment having a chamber for performing plasma treatment, the plasma treatment equipment comprising:

a plasma excitation electrode to which a power for plasma excitation is supplied, the plasma excitation electrode being provided in the chamber;

a susceptor electrode that is opposed to the plasma excitation electrode provided in the chamber; and

an electrode shield of the susceptor electrode in the chamber, the electrode shield disposed adjacent to the susceptor electrode,

wherein at least one of the susceptor electrode and the electrode shield thereof has the same DC potential as that of a chamber wall of the chamber,

the susceptor electrode being an electrode into which a high frequency electric current based on the power for plasma excitation flows after passing through a plasma space,

the chamber wall of the chamber and at least one of the susceptor electrode and the electrode shield thereof are AC shorted to each other by a plurality of metal plates, each metal plate having a first end connected to a first short point on the shield and a second end connected to a second short point on an inner surface of the bottom wall of the chamber, and

the susceptor electrode is connected to the chamber wall of the chamber by a bellows disposed outside the chamber, the plurality of metal plates are configured to pass high frequency current so that the plasma treatment equipment have a small susceptance impedance with low frequency dependency and high power consumption efficiency.

24. (New) The plasma treatment equipment according to claim 1, wherein the plurality of metal plates are mesh forms disposed in point symmetry with respect to a center of said electrode shield.

## Conclusion

Claims 1-24 are pending. For at least the reasons given above, the Applicants respectfully submit that the pending claims are allowable, or would be allowable if a terminal disclaimer were to be submitted.

The Examiner is respectfully requested to contact the undersigned in the event that a telephone interview would expedite consideration of the application.

Respectfully submitted,

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